# RCRA Corrective Action Action Levels and Media Cleanup Standards

***BACKGROUND:*** The 1984 passage of the Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA) strengthened the U.S. Environmental Protection Agency's (EPA's) ability to require hazardous waste management facility owners/operators to perform corrective action to address releases of hazardous waste or hazardous constituents. Under RCRA, Section 3008(h), EPA may issue administrative orders compelling corrective action at interim status facilities. Under RCRA Section 3004(u), any permit issued to a treatment, storage, or disposal (TSD) facility after November 8, 1984, must address corrective for releases of hazardous waste or hazardous constituents from any solid waste management unit (SWMU) at the facility. Under RCRA Section 3004(v), EPA may compel a TSD facility owner/operator to remediate releases that migrate beyond the facility's boundary.

On July 27, 1990 (55 FR 30798 et seq.), EPA proposed a regulatory framework for implementing corrective action under Sections 3004(u), 3004(v), and 3008(h). This framework, proposed under 40 CFR Subpart S, establishes requirements for conducting corrective action investigations and for evaluating, selecting, and implementing appropriate corrective action remedies at SWMUs. The proposed regulations define a SWMU broadly to include any discernible unit at which solid wastes were placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Some States and EPA Regions are currently using the proposed regulations as the basis for the performance of corrective action at permitted and interim status DOE facilities.

The proposed corrective action framework involves four phases: RCRA Facility Assessment (RFA), RCRA Facility Investigation (RFI), Corrective Measures Study (CMS), and Corrective Measures Implementation (CMI). This Information Brief describes how action levels determine if it is necessary to perform a CMS, and media cleanup standards (MCSs), which are used to set the standards for remediation performed in conjunction with CMI, are set. It is one of a series of Information Briefs on RCRA Corrective Action.

***STATUE:*** RCRA Sections 3008(h), 3004(u), and 3004(v).

***REGULATIONS:*** Proposed 40 CFR 264 Subpart S, (55 FR 20798 et seq.; July 27, 1990

***REFERENCES:***

1. "Ground-Water Monitoring Under RCRA," U.S. Department of Energy, Office of Environmental Guidance, RCRA/CERCLA Division, RCRA Information Brief, EH-231-039/1193 (November 1993).

2. "RCRA Corrective Action Program Guide - Interim Guidance," U.S. Department of Energy,Office of Environmental Guidance, RCRA/CERCLA Division, Guidance Manual, DOE/EH-0323, May 1993.

## What are Action Levels?

ALs are health- and environmentally-based levels of hazardous constituents in ground water, surface water, soil, or air, determined to be indicators for protection of human health and the environment (55 FR 30814 et seq.; July 27, 1990). In the corrective action process, the regulator uses Als to determine if the owner/operator of a TSD facility is required to perform a CMS.

Proposed Subpart S establishes ALs for hazardous constituents, not hazardous wastes, because many hazardous wastes are complex mixtures that include numerous hazardous constituents. Proposed Subpart S also sets ALs for some hazardous substances, such as asbestos, that are not listed as hazardous waste constituents in Appendix VIII to 40 CFR 261 or as hazardous constituents in ground water in Appendix IX to 40 CFR 264 (55 FR 30814 et seq.; July 27,

1990). (Reference 1 provides additional information about the purpose of the Appendix VIII and Appendix IX lists of hazardous constituents.)

## How are ALs established?

The regulator must specify the following promulgated standards as ALs for hazardous constituents where they are available. In groundwater, ALs are maximum contaminant levels (MCLs) promulgated under the Safe Drinking Water Act [proposed 40 CFR 521 (a)(1)]. In surface water, ALs are:

- water quality standards established under the Clean Water Act by the State in which the facility is located;
- numerical interpretations of State narrative water quality standards; or
- MCLs promulgated under the Safe Drinking Water Act (if the surface water is designated by the State for drinking water supply) [proposed 40 CFR 521(c)].

For soils, air, and in cases where the promulgated standards listed above are not available, the regulator must develop ALs:

- In a manner consistent with EPA guidelines for assessing the health risks of environmental pollutants;
- based on scientifically valid studies conducted in accordance with Toxic Substances Control Act Good Laboratory Practice Standards (or the equivalent);
- that for carcinogens represent a concentration associated with an upper-bound lifetime cancer risk of $1 \times 10^{-6}$, based on continuous, constant lifetime exposure, and that consider overall weight-of-evidence for carcinogenicity; and
- that for systemic toxicants represent a concentration to which the human population (including sensitive subgroups) could be exposed on a daily basis without appreciable risk of deleterious effects during a lifetime [proposed 40 CFR 264.521(a)(2)(i)-(iv), (b),(c), and (d)].

EPA published a list of example concentrations of chemicals in air, water, and soil that meet the four criteria for setting ALs that are listed above. This list is contained in Appendix A to the preamble of the proposed rule. EPA established these concentrations using an assessment process that:

- evaluated the quality and weight-of-evidence of supporting toxicological, epidemiological, and clinical studies; and
- used a set of exposure assumptions that are listed in Appendix D to the preamble of the proposed rule (55 FR 30816 et seq.; July 27, 1990).

If a concentration level meeting the criteria listed above is not available for a hazardous constituent, the regulator may set the AL on the basis of "...available data using reasonable worse-case assumptions," or at the background concentration of the hazardous constituent [proposed 40 CFR 264.521(e)].

## What exposure assumptions does the regulator use when an AL must be developed?

In establishing ALs, the regulator must use the following exposure assumptions:

- For ground water, soil, and surface water designated as a drinking water source, exposure occurs through consumption of the water or soil [proposed 40 CFR 264.521(a)(2), 264.521(d), and 254.521(c)(4), respectively].
- For surface water not designated as a drinking water source, exposure assumptions must be based on the use of the surface water [proposed 40 CFR 264.521(c)(5)].
- For air, exposure occurs through inhalation at the facility boundary (or at a location closer to the unit if necessary to protect human health and the environment) [proposed 40 CFR 264.521(b)].

## What are Media Cleanup Standards?

MCSs are the concentrations of hazardous constituents in groundwater, surface water, air,

and soils that must be achieved by the corrective measures implemented by the owner/operator [proposed 40 CFR 264.525(d)]. MCSs are associated with points or locations where the owner/operator must demonstrate compliance [proposed 40 CFR 254.525(e)].

## How are MCSs established?

The regulator must establish MCSs in affected media which protect human health and the environment [proposed 40 CFR 264.525(d)(1)(i)]. Unless lower levels are deemed necessary to protect environmental receptors, the regulator must establish MCSs as follows:

- for carcinogens, at concentration levels which represent an excess upperbound lifetime risk to an individual of between 1 x $10^{-4}$ and 1 x $10^{-6}$ [40 CFR 264.525(d)(1)(ii)(A)], and
- for systemic toxicants, at concentration levels to which the human population (including sensitive subgroups) could be exposed on a daily basis without appreciable risk of deleterious effects during a lifetime [proposed 40 CFR 264.525(d)(1)(ii)(B)].

In setting MCSs that meet these standards, the regulator may consider:

- multiple contaminants in the medium;
- exposure threats to sensitive environmental receptors;
- other site-specific exposure or potential exposure to contaminated media; and
- the reliability, practicability, or relevant features of the remedy [proposed 40 CFR 264.525(d)(1)(iii)].

For ground water or surface water that is a current or potential source of drinking water, the regulator must also consider MCLs promulgated under the Safe Drinking Water Act in setting MCSs [proposed 40 CFR 264.525(d)(1)(iv).

EPA developed the approach described above to allow for a pragmatic and flexible evaluation of potential remedies at a site while still protecting human health and the environment. Reference 2, Chapter 5, and the preamble to the proposed rule (55 FR 30825-30838 et seq; July 27, 1990) provide information about potential applications of this approach under different types of site-specific circumstances.

## What is the difference between ALs and MCSs?

While ALs are triggers indicating the need to perform a CMS, MCSs are the actual concentration levels to which hazardous constituents must be reduced in affected media as a result of implementing the selected remedy. MCSs are associated with points or locations where the owner/operator must demonstrate compliance [proposed 40 CFR 264.525(e)].

Where existing standards are used as indicators of a threat to human health or the environment (e.g., MCLs), ALs, and MCSs may be set at the same level. In the absence of existing standards, the regulator may first establish appropriate ALs as target MCSs. The regulator may later modify target MCSs based on ALs, as appropriate, when site-specific risk factors are considered (see Reference 2, Chapter 5).

## Is an MCS established for each AL that is exceeded?

The regulator may set an MCS for each hazardous constituent for which an AL has been exceeded. Alternatively, the regulator may specify MCSs for a subset of hazardous constituents which are the most toxic, mobile, persistent, and difficult to remediate, considering the concentrations at which they are present at the site. This approach may be most appropriate where there are large numbers of hazardous constituents present in a medium (55 FR 30826 et seq.: July 27, 1990.

## When is remediation to MCSs not required?

The regulator may decide not to require the owner/operator to remediate a release to MCSs if:

- the affected medium is contaminated by substances that are naturally occurring or have originated from a source other than a SWMU at the facility, and those substances are present in concentrations such that remediation of a release from the SWMU would not provide a significant reduction in risks to actual or potential receptors; or

- the release occurs to ground water that is not a potential source of drinking water or hydraulically connected to waters to which hazardous constituents are migrating, or are likely to migrate, at concentrations greater than ALs; or

- remediation of the release(s) to MCSs is technically impractical [proposed 40 CFR 264.252(d) (2)].

If the owner/operator can demonstrate one of those cases, the regulator may:

- set alternative MCSs that are technically practicable;

- require the owner/operator to implement source control measures to inhibit further releases into the environment; or

- determine that cleanup to MCSs is not necessary [proposed 40 CFR 264.252(d)(3) and 55 FR 30828 et seq.: July 27, 1990].

## Can DOE participate in the process of setting ALs and MCSs for hazardous constituents?

ALs and MCSs are set by the regulator. However, when no promulgated standards (e.g., MCLs) exist, DOE can influence the process of setting ALs and MCSs by providing the regulator with appropriate data and information. For example, DOE can identify or develop data on which to base ALs so the regulator is not forced to rely solely on existing data or background levels. Similarly, DOE can recommend MCSs to the regulator in the CMS based on the analysis of the expected performance of alternative remediation strategies.

## Is it possible for different ALs and MCSs to be set for different units at the same facility?

The proposed regulations do not address the possibility of setting different ALs and MCSs for different units at the same facility. ALs are based on promulgated standards when such standards are available, and promulgated standards do not vary for different units. Thus, different ALs for different units at the same facility would be unlikely. Similarly, the methodology used by the regulator to develop ALs when promulgated standards are not available also would be unlikely to result in different ALs for different units.

Different MCSs, on the other hand, could be set for different units at the same facility because of site-specific factors (e.g., the presence of sensitive environmental receptors) that the regulator considers in setting MCSs. For example, at very large sites such as those owned by DOE, the regulator might have to impose a more protective MCS at a unit at one end of the site because of the presence of an endangered species. This consideration might not be relevant to the setting of an MCS for the same hazardous constituent at a unit at the other end of the site. In addition, the owner/operator may not be required to remediate a particular unit to the MCSs set for other units at the facility if it can be demonstrated to the regulator that:

- contamination at the unit originated from an outside source; or

- remediation to MCSs set for other units is technically impractical [proposed 40 CFR 264.525 (d) (2)].

**Questions of policy or questions requiring policy decisions will not be dealt with in EH-231 Information Briefs unless that policy has already been established through appropriate documentation. Please refer any questions concerning the subject material covered in this Information Brief to Jerry Coalgate, RCRA/CERCLA Division, EH-231, (202) 586-6075.**